

What is Claimed is:

- 5 1. A pipe or liner suitable for use in transporting substances in oil and gas applications, comprising a melt-mixed blend of:
- (a) at least one polyolefin;
 - (b) at least one polyamide incompatible with said at least one polyolefin (a); and
 - 10 (c) at least one alkylcarboxyl-substituted polyolefinic compatibilizer;
- wherein said polyolefins (a) are in a continuous matrix phase and said polyamides (b) are present in a discontinuous distributed phase in the form of a multitude of thin, substantially parallel, and overlapping layers of material embedded in the continuous phase, and further wherein at least a
- 15 portion of said compatibilizer (c) is present between said layers and promotes adhesion therebetween.
2. The pipe or liner of claim 1 wherein the at least one polyolefin is selected from the group consisting of polyethylene, polypropylene, polybutylene,
- 20 and copolymers of those materials.
3. The pipe or liner of claim 1 wherein the at least one alkylcarboxyl-substituted polyolefinic compatibilizer is selected from the group consisting of polyolefins that have carboxylic moieties attached thereto, either on the
- 25 polyolefin backbone itself or on side chains.
4. The pipe or liner of claim 1 wherein the at least one polyamide is selected from the group consisting of polycaproamide, poly(11-aminoundecanoamide), polydodecanoamide, poly(hexamethylene sebacamide), poly(hexamethylene dodecanoamide), and copolymers of
- 30 poly(hexamethylene adipamide) with polycaproamide.

5. The pipe or liner of claim 1 wherein the at least one polyamide further comprises amorphous polyamide copolymers derived in part from aromatic monomers.
- 5 6. The pipe or liner of claim 1 wherein the discontinuous distributed phase is present in layers of material more than about 0.5 micrometers and less than about 50 micrometers thick.
7. The pipe or liner of claim 1 wherein the melt-mixed blend further
10 comprises at least one plasticizer.
8. The pipe or liner of claim 1 wherein the melt-mixed blend further comprises at least one lubricating agent.
- 15 9. The pipe or liner of claim 1 wherein the melt-mixed blend further comprises at least one stabilizer.
10. The pipe or liner of claim 1 wherein the at least one polyamide each has a melting point in the range of about 150 °C to 250 °C.
20
11. The pipe or liner of claim 1 wherein the at least one polyamide each has a melting point in the range of about 180 °C to 225 °C.
12. The pipe or liner of claim 1 wherein the at least one polyamide is present
25 in about 2 to 40 weight percent, the at least one polyolefin is present in about 60 to 97 weight percent, and the at least one alkylcarboxyl-substituted polyolefinic compatibilizing agent is present in about 0.25 to 12 weight percent, where all weight percents are based on the total amount of polyamide, polyolefin, and alkylcarboxyl-substituted polyolefinic
30 compatibilizing agent.
13. The pipe or liner of claim 1 wherein the at least one alkylcarboxyl-substituted polyolefinic compatibilizer is each prepared by grafting a

dicarboxylic acid or dicarboxylic acid derivative such as an anhydride, ester, or diester to a polyolefin.

- 5 14. The pipe or liner of claim 1 wherein the melt-mixed blend further comprises at least one silane cross-linking agent.
15. The pipe or liner of claim 1 wherein the polyolefin is cross-linked.
- 10 16. The pipe or liner of claim 15 wherein the cross-linked polyolefin is cross-linked polyethylene.
17. The pipe or liner of claim 1 in the form of a flexible pipe.
- 15 18. The pipe or liner of claim 1 in the form of a line pipe.
19. The liner of claim 1 in the form of a down-hole casing liner.